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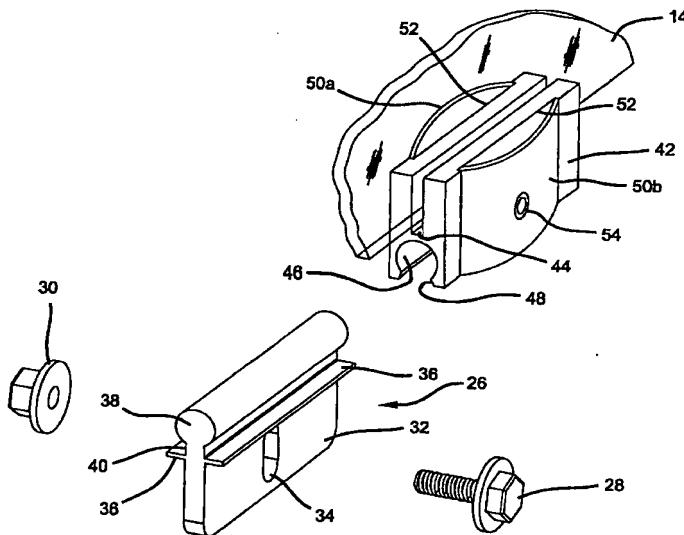
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(54) Title: WINDOW LIFT MECHANISM



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(57) **Abstract:** A dual rack and pinion system (18) is provided for a window lift mechanism (12). The window lift mechanism (12) includes improved window brackets (42) for simple mounting to a window (14). A modular frame design (16) is provided to improve assembly of the window lift mechanism into the door (10) of a vehicle. An improved assembly method is provided for the dual rack and pinion system. The system is also provided with a smart motor (134) and incorporates resilient shock absorbers (182) in the dual rack and pinion gear train to allow more time for the smart motor to detect and react to an obstruction in the window. The support bracket (42) permits axial and rotational movement of the window relative to the support bracket.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/09368

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : E05F 11/38
US CL : 49/375

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 49/375, 374, 372, 348, 349

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3,868,788 A (Podolan) 04 March 1975 (04.03.1975), whole document.	1, 2, 8
X	US 5,363,595 A (Wirsing) 15 November 1994 (15.11.1994), whole document.	1, 2, 6, 7
X	US 6,131,339 A (Ramus) 17 October 2000 (17.10.2000), whole document.	9-11
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Y		9, 13-15
X	US 4,991,351 A (Bertolini) 12 February 1991 (12.02.1991), whole document.	40-44
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Y	US 5,966,872 A (Wasek et al.) 19 October 1999 (19.10.1999), whole document.	1, 3-5, 9, 13-15
A	US 3,591,982 A (Nantau) 13 July 1971 (13.07.1971), whole document.	1-15, 40-44
A	US 6,588,152 A (Cabbane) 08 July 2003 (08.07.2003), whole document.	1-15, 40-44



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

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INTERNATIONAL SEARCH REPORT

International application No. PCT/US04/09368	
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C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,453,617 A (Klippert et al.) 24 September 2002 (24.09.2002), whole document.	1-15, 40-44
A	US 5,987,820 A (Shibanushi) 23 November 1999 (23.11.1999), whole document.	1-15, 40-44
A	US 5,729,930 A (Schust et al.) 24 March 1998 (24.03.1998), whole document.	1-15, 40-44
A	US 5,848,032 A (Ballor et al.) 18 July 1989 (18.07.1989), whole document.	1-15, 40-44
A	US 4,794,733 A (Kanemaru) 03 January 1989 (03.01.1989), whole document.	1-15, 40-44
A	US 4,575,967 A (Bickerstaff) 18 March 1986 (18.03.1986), whole document.	1-15, 40-44
A	US 4,299,057 A (Hagemann et al.) 10 November 1981 (10.11.1981), whole document.	1-15, 40-44
A	US 3,228,677 A (Martens) 11 January 1966 (11.01.1966), whole document.	1-15, 40-44
A	US 2,899,832 A (Meyer) 18 August 1959 (18.08.1959), whole document.	1-15, 40-44
A	US 2004/0154228 B (Farrar et al.) 12 August 2004, (12.08.2004), whole document.	1-15, 40-44
A	US 6,125,588 A (Schultz) 03 October 2000 (03.10.2000), whole document.	1-15, 40-44
A	US 5,692,273 A (Rodde) 02 December 1997 (02.12.1997), whole document.	1-15, 40-44

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/09368

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Continuation Sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-15 and 40-44

Remark on Protest

<input type="checkbox"/>
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The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/09368

Continuation of Item 4 of the first sheet:

The title does not meet the requirements of PCT Rule 4.3 because it is not precise.

The title has been rewritten as --A window bracket for a window lift mechanism--

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I claims 1-15 and 40-44, drawn to a window pane mounting bracket.

Group II claims 16-39 and 53-63, drawn to a rack and pinion system window regulator.

Group III claims 45-52, drawn to a mounting bracket.

The inventions listed as Groups I, II and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons.

The special technical features of the invention of group I are directed only to a specific type of mounting bracket for mounting a window pane to a window regulator. The special technical features of the invention of group I are not specifically related to or limited to any type of window regulator. Therefore, the special technical features of the invention of group I are capable of use with a variety of different types of window regulators such as a cable type window regulator or window regulator that does not include a support bracket. Since the special technical features of the invention of group I are not limited to the special technical features of the inventions of groups II and III, it is not related to the inventions of groups II and III for examination purposes.

The special technical features of the invention of group II are directed to only a rack and pinion type window regulator. The special technical features of the invention of group II are not specifically related to or limited to the special technical features of the invention of group III, i.e., a mounting bracket that includes a gear cavity, etc. Since the special technical features of the invention of group II are not limited to use with the special technical features of the invention of group III, the invention of group I is not related to the invention of group II for examination purposes.

Finally, the invention of group III is not related to the inventions of groups I and II for the reasons set forth above.